SA Tomorrow Sustainability Plan

Dark Sky Policy Evaluation Process Workshop #2

April 18, 2017

Dark Sky Policy Evaluation Work Group

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Agenda

- Welcome
- Staff Research Summary
- National Best Practices
- Outdoor Lighting Standard Comparison
- Stakeholder Outreach
- Next Steps

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Staff Research

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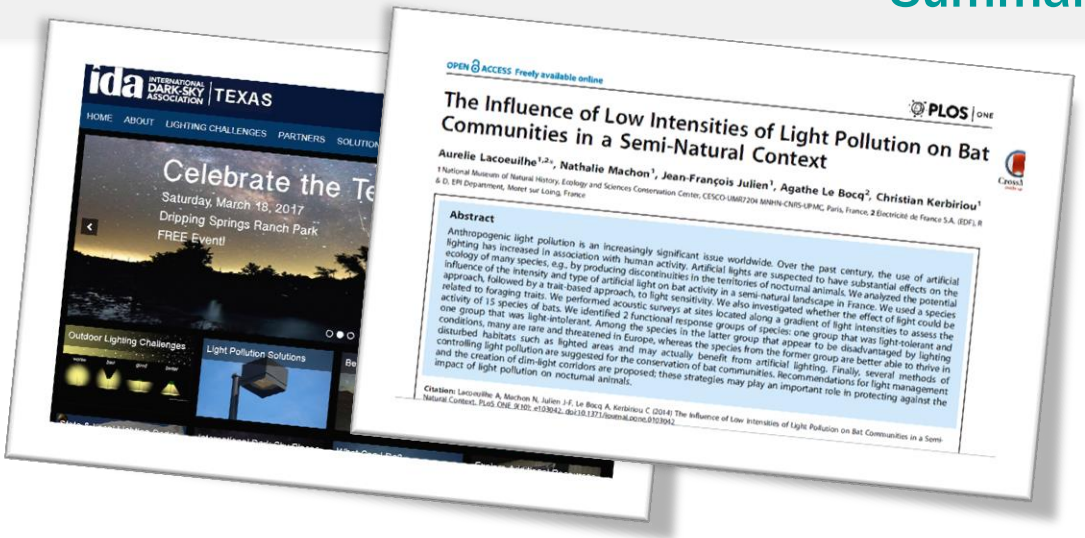
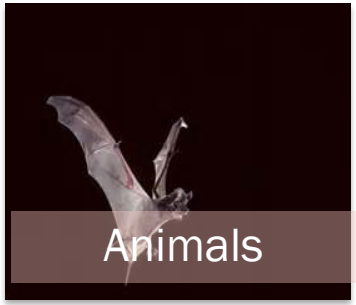
Staff Research

Summary

- Scientific Studies
- Academic Articles
- News articles

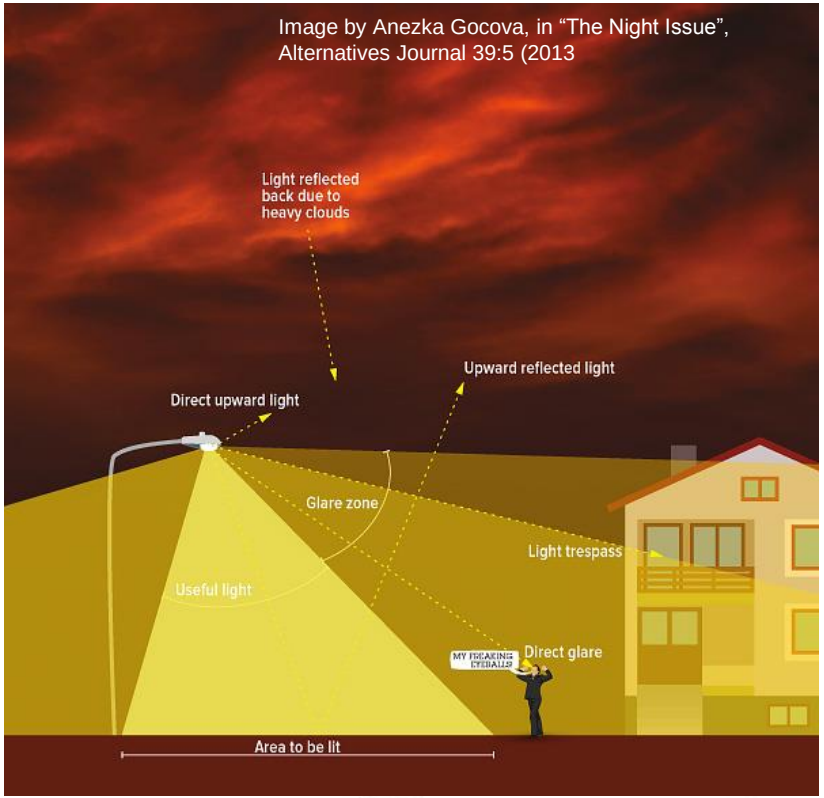




Staff Research

Light Pollution

"Light Pollution is lighting that is overused, misdirected or otherwise obtrusive."



Components of Light Pollution

Staff Research

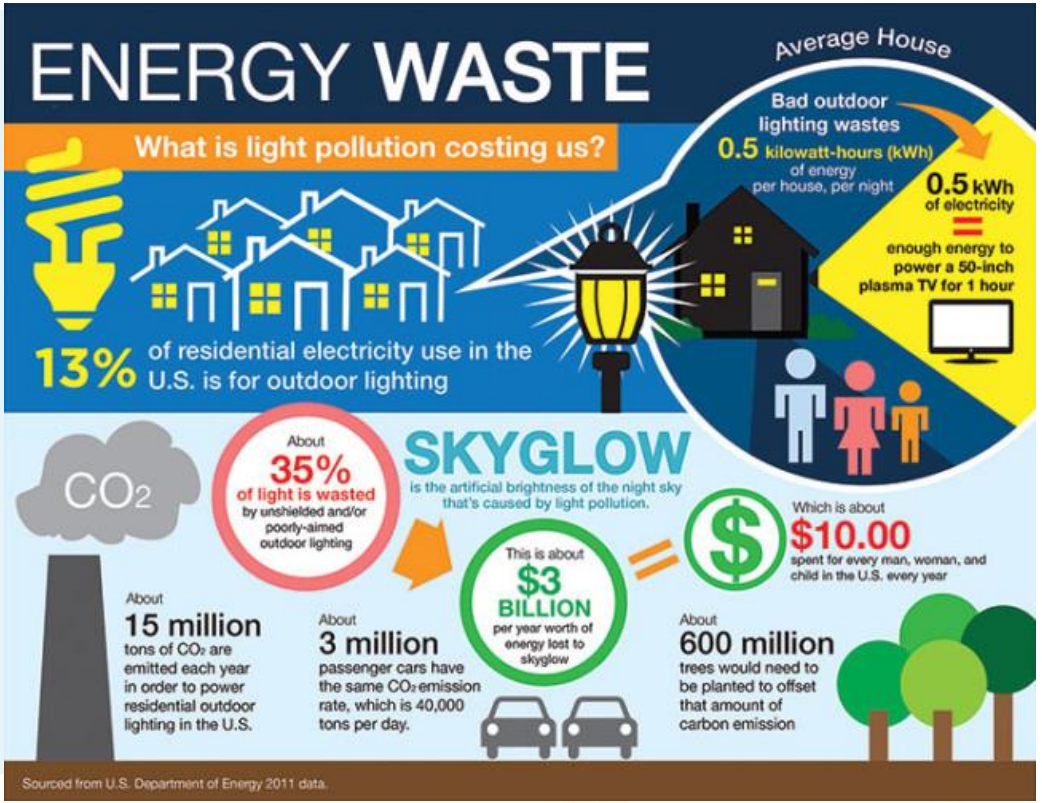
- Glare – excessive brightness that causes visual discomfort
- Skyglow – brightening of the night sky over inhabited areas
- Light trespass – light falling where it is not intended or needed
- Clutter – bright, confusing and excessive groupings of light sources




Energy Waste

Staff Research

- Energy and light waste
  - Billions of Dollars
  - Millions of Tons of CO_2
- Blue-rich vs white light
- Energy efficiency in LED
  - LEDs and compact fluorescents (CFLs) can help reduce energy use and protect the environment
  - Dimmers, motion sensors and timers can help to reduce average illumination levels and save even more energy.



Ecology and Wildlife

Staff Research

- Light sensitive wildlife impacted by light pollution
  - Amphibians
  - Birds
  - Mammals
  - Insects
  - Plants
- Affects
  - Migration
  - Reproduction
  - Nourishment
  - Rest/Sleep
  - Protection from predators
- Ecosystem-Everything is connected

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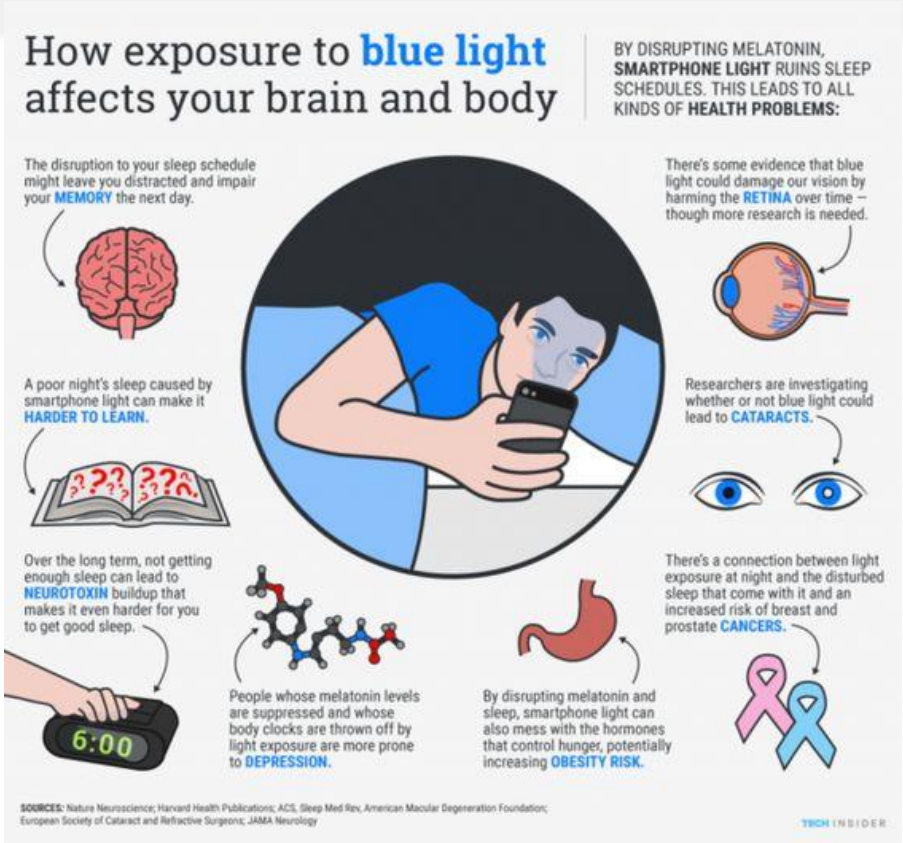
Wavelength ranges for monochromatic light (nm)

color	1	2	3	4
red	647–700	647–760	630–700	620–800
orange	585–647	585–647	590–630	590–620
yellow	575–585	575–585	570–590	560–590
green	491–575	491–575	500–570	480–560
blue	424–491	424–491	450–500	450–480
violet	400–424	380–424	400–450	400–450

Human Health

Staff Research



- Exposure to light at night (LAN) decreases pineal melatonin (MLT)
  - Circadian rhythm disruption
  - Breast cancer risk increase
- Many sources of blue light inside home (technology)

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Public Safety

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- Crime
  - Not conclusive that improved lighting prevents crime
- Roadway lighting
  - Positive where none is present
  - Reduced illumination in areas where there was lighting showed no increase in accidents
- Brighter Does Not Mean Safer
  - Glare creates hazards ranging from discomfort to visual disability

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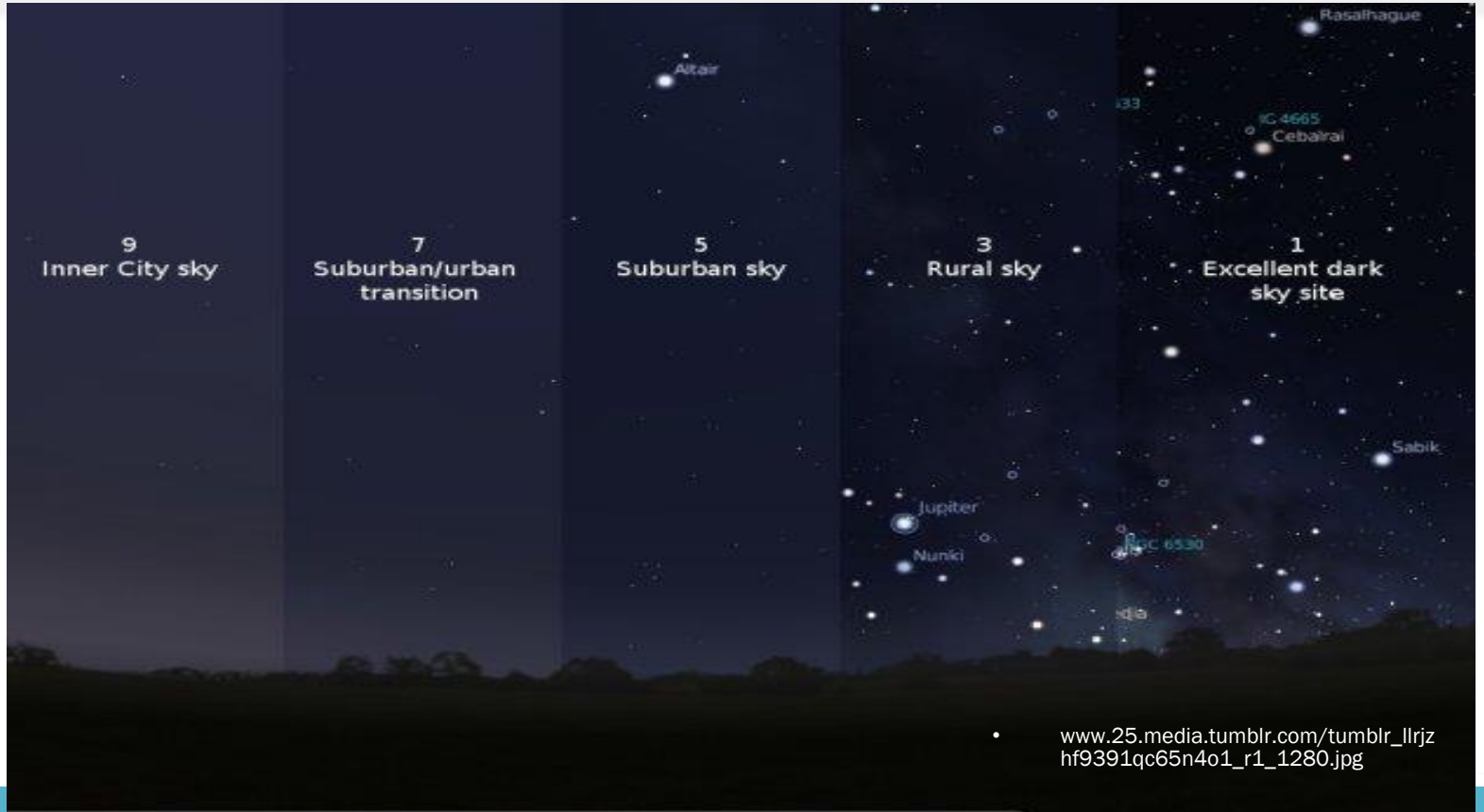
Public Safety

Staff Research

IDA, George Fleenor

Bortle Dark-Sky Scale

Staff Research



- www.25.media.tumblr.com/tumblr_llrjzhf9391qc65n4o1_r1_1280.jpg


IDA Photo by Dan and Cindy Duriscoe

Staff Research

Summary

- Impacts from light pollution affect wildlife, ecosystems, humans
- More or brighter lights don't make it safer
- Technology can make outdoor lighting effective and less harmful
- Small changes can make big impact
  - Lighting color temperature
  - Shielded or downward light fixtures
  - lighting intensity (dimmers)
  - Reduce times of illumination (timers, motion sensors)

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Best Practices

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States with Light Pollution Laws

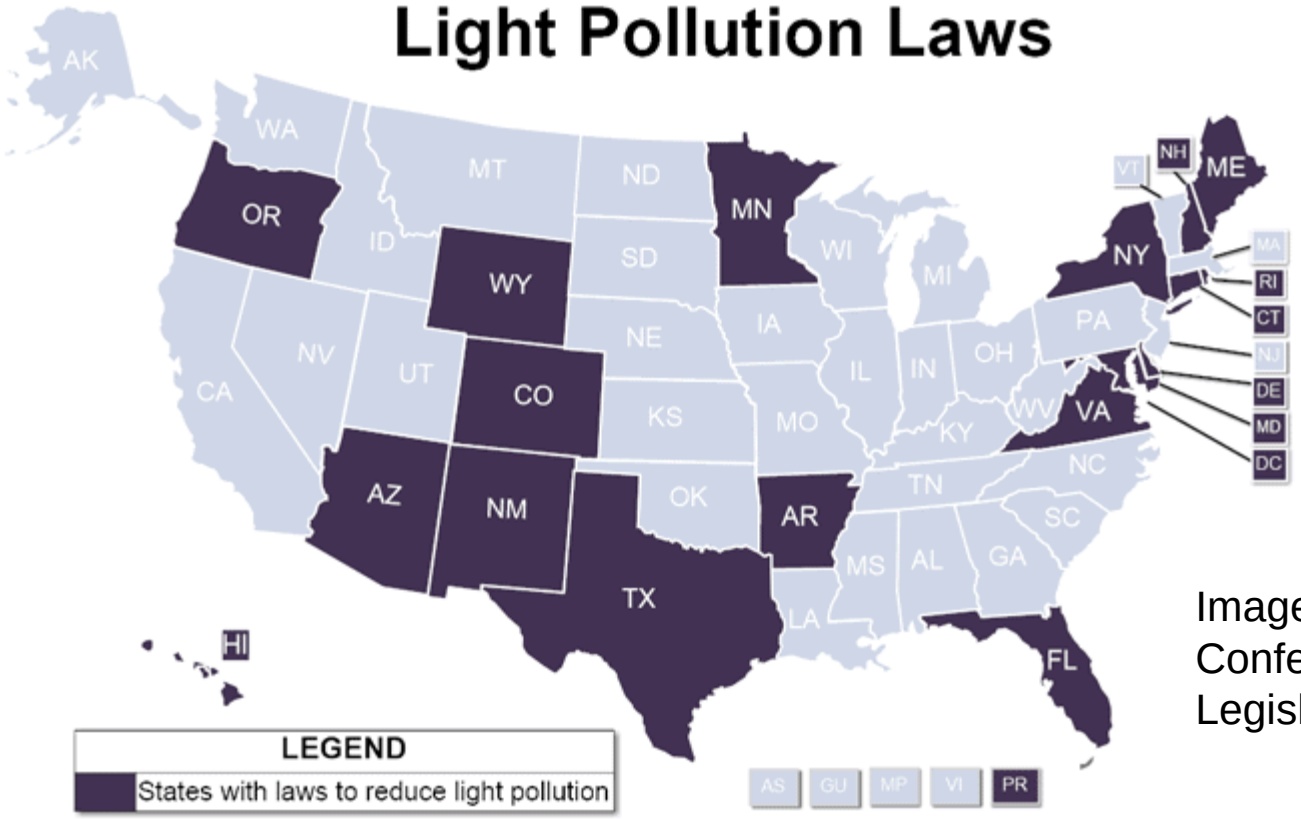

Image: National Conference of State Legislature

Certified IDA International Dark Sky Communities

- Beverly Shores, Indiana (U.S.)
- Big Park / Village of Oak Creek, Arizona (U.S.)
- Bon Accord (Canada)
- Borrego Springs, California (U.S.)
- Coll (Scotland)
- Dripping Springs, Texas (U.S.)
- Flagstaff, Arizona (U.S.)
- Homer Glen, Illinois (U.S.)
- Horseshoe Bay, Texas (U.S.)
- Moffat (Scotland)
- Møn and Nyord (Denmark)
- Sark (Channel Islands)
- Sedona, Arizona (U.S.)
- Thunder Mountain Pootsee Nightsky (U.S.)
- Westcliffe and Silver Cliff, Colorado (U.S.)

MINIMIZING ENCROACHMENT AND INCOMPATIBLE LAND USE

States with Statutes Requiring Local Governments to Communicate with Military Installations

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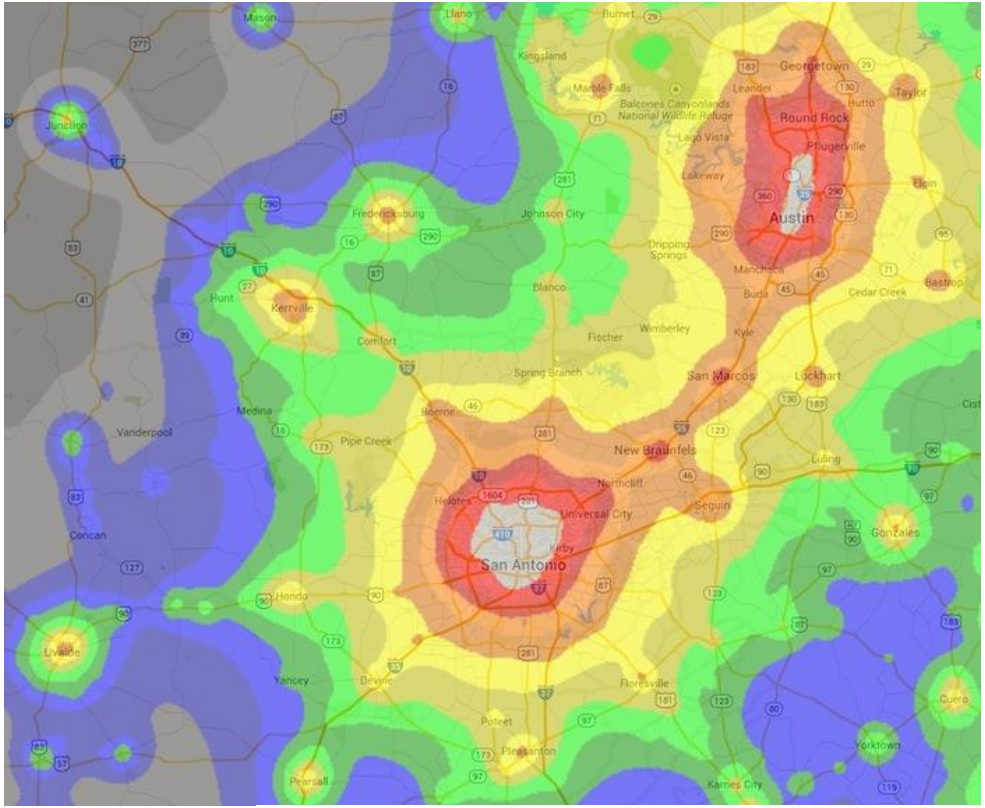
Light Pollution of Texas & Region



Light pollution map of San Antonio and surrounding areas. Image courtesy of Google Earth and David Lorens (University of Wisconsin-Madison

Texas Cities & Counties

Outdoor Lighting Ordinances or Proclamations

- Alpine (5/00)
- Austin (January 2007)
- Boerne (June 2008)
- Bulverde (2003)
- City of Dripping Springs (9/2016
- City of LaGrange Dark-Sky Resolution (December 2011)
- Comal County
- El Paso (May 2005)
- Fredericksburg
- Flower Mound (7/97)
- Fort Bend County (George Observatory) 3/23/04
- Fulshear (2015)
- Frisco (Nov. 2000)
- Glen Rose (5/01)
- Harker Heights (spring/summer 2002)
- Helotes (January 2009)
- Jeff Davis County (McDonald Observatory) (2002)
- Lago Vista
- LLano (Jan 2016)
- Marfa (2000)
- Midland (2007)
- Plano (2000)
- Port Aransas (June 2009)
- San Antonio (December 2008)
- Village of Wimberley (2001)
- Webberville (June 2013)

Source: IDA

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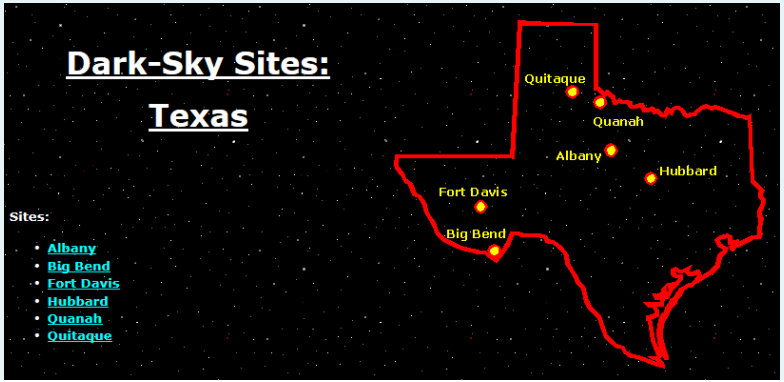
TX Cities & Counties with Outdoor Lighting Ordinances

Astronomical/Other

- Alpine-McDonald Observatory (2010)
- Dripping Springs
- Galveston



Images: International Dark-Sky Association.

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TX Cities & Counties with Outdoor Lighting Ordinances

Military

- El Paso (2005)
- Bexar County- Camp Bullis (2008)
- Comal County-Camp Bullis (2008)

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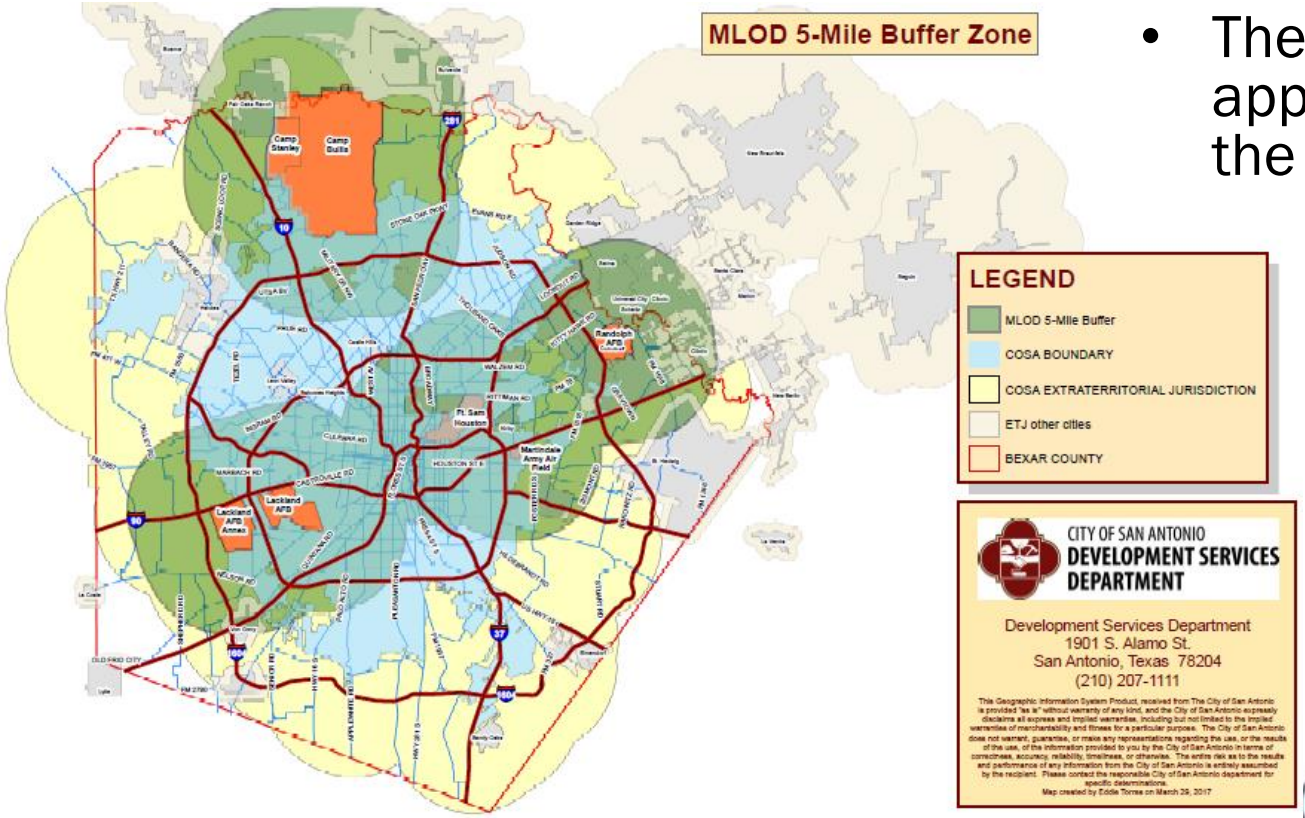

- The MLOD covers approximately 2/3 of the City

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DSD Outdoor Lighting Standard Comparison

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Existing Lighting Codes

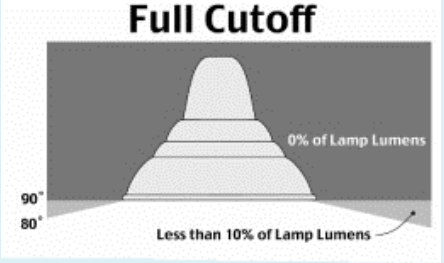
- 2015 IECC
  - Commercial Deals only in overall electrical consumption, Residential restrictions only on lamp and fixture efficacy
- Military Lighting Overlay District (MLOD)
  - Has various limits for Commercial, Residential, Signage
- Bexar County Lighting Order
  - Limits Commercial, Residential, Signage

2015 IECC

- Limits outdoor lighting to total base wattage (500W – 1300W) plus allowable per designated area.
- Limits based on matrix of lighting zones, tradable surfaces, and non-tradable surfaces
  - Lighting zones (1-4) based on land usage
  - Tradable surfaces include uncovered parking, building entrances, sales canopies, and outdoor sales
  - Non-tradable surfaces include building facades, ATM's, Gatehouses, loading areas for first responders, drive-up windows, and parking near 24-hour retail entrances
- New development above 1200' elevation within 1 mile shall be fully screened

Military Lighting Overlay District

- Currently only enforced in the 5-mile buffer around Camp Bullis/Camp Stanley
- Ordinances still need to be adopted to enact buffers around remaining military installations
- Commercial
  - All fixtures shall be “Full Cutoff”
  - Intermittent lighting shall be controlled by motion sensor and not exceed 5 minutes following last activity
  - Trespass lighting limited to ≤ 2.5 foot-candles at the property line
  - Floodlight fixtures aimed to prevent radiation of light into open sky at angle above horizontal
  - Outdoor lights, except for security and parking lot illumination, businesses must turn off lights > 2 foot-candles after 11:00 pm



Military Lighting Overlay District

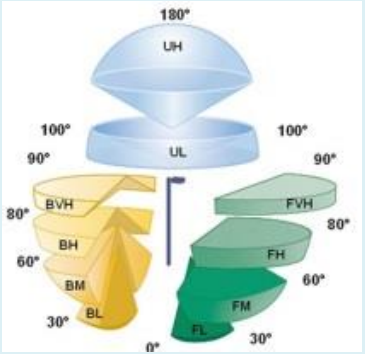
- Commercial – Parking Lots
  - Pole height limited to 30 ft
  - All fixtures in surface lots and top decks of parking garages shall be Full Cutoff
  - Reflectivity
    - Surface lot coatings shall reflect no more than what an asphalt surface would reflect from an average of 20 foot-candles
    - Top decks of parking structures shall reflect no more than what an asphalt surface would reflect from an average of 15 foot-candles
  - One Hour after closing businesses must turn off at least 50% of lighting luminaires, but luminaires may be set to turn back on with a motion sensor
- Outdoor Sign Lighting
  - All signs within ¾ mile of Camp Bullis/Stanley shall be positioned and have “Dark Sky” approved shielding devices and should not be positioned parallel to installation
  - On premise signs may only operate from business opening to ½ hour after closing
  - Single tenant signs ≤7 ft-candles, multi tenant signs ≤ 12 ft-candles
  - Exterior signs positioned in “top down” manner

Military Lighting Overlay District

- Outdoor Sign Lighting
  - Conventional non-digital off-premises signs must use not more than 2 (400 W) luminaires
  - All signs illuminated no greater than 0.3 ft-candles over ambient light levels
- Street Lighting
  - Standard street lights shall be Full Cutoff
  - Ornamental street lights shall be Full Cutoff or Cutoff
- Laser source light shall not be used above horizontal plane
- Searchlights strictly prohibited
  - Exception for law enforcement, medical activities, etc.
- For full list of exceptions reference UDC Sec. 35-339.04 (b)(15)

BCALS & Dark Sky differences with MLOD

- B.U.G. compliant fixtures for commercial and IDA approved fixtures for residential areas
- Exterior lighting allowances by zones and categories within each zone
- Correlated Color Temperature limits
  - BCALS ≤ 4100K and IDA ≤ 3000K



- Parking Lot lighting based on light intensity on surface, rather than at source
- Max Pole height (BCALS) 25 feet
- Street lights U0 B.U.G. rating
- Offers both prescriptive and performance paths

Stakeholder Outreach

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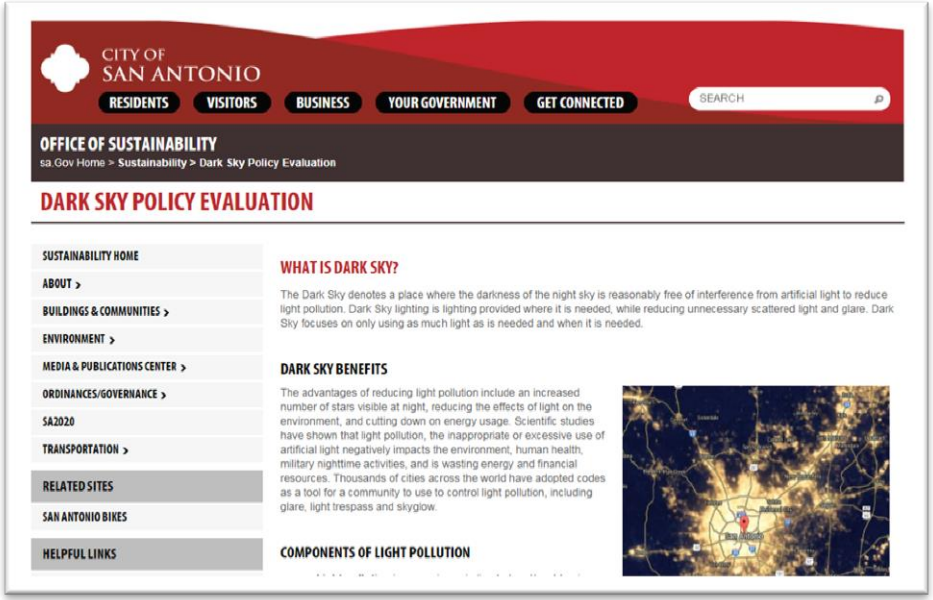
Stakeholder Outreach

- Website
- Taking General Comments
- Key Stakeholders
  - Chambers of Commerce
  - Sign Industry
  - Auto dealers
  - Engineers/ Architects
  - Schools



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Next Steps

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Next Steps

- Next Meeting: May 23, 2017
- Military Overview
- Evaluate pro's and con's of expanding ordinance
- Discuss Scenarios for expanding ordinance

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Thank you

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Healthy Environment | Thriving Economy | Inclusive & Fair Community